SUMMARY OF THE THESIS
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A continuous aerobiological survey was carried out for two years (1994-1996) at Madhyamgram Field Station situated in the northern suburb of Greater Calcutta with Burkard volumetric sampler. A total of 47 pollen types were recorded from the air mainly reflecting the vegetation of the study area. All the recorded pollen types were studied in terms of their seasonal and diurnal periodicities. Among the recorded pollen types, the most abundant and common type originated from the Poaceae, followed by Trema orientalis, Cyperaceae, Areca, Carica, Cheno-Amaranthaceae, etc. The vertical profile of the pollen concentration was studied with rotorod samplers mounted at different heights which showed a direct correlation with the source height.

The recorded pollen types were collected from plants of same family/genus/species of the study area and their extracts were used for skin-prick tests (SPT) on adult respiratory allergic patients. Out of these types, 26 pollen taxa were found to be allergenically potent. Saccharum showed the maximum allergenicity followed by Azadirachta, Phoenix, Borassus, Cyperus, etc. The pollen of Trema, Justicia and Tamarindus showed very little reactivity though they were very frequent in air.

On the basis of SPT results, eight pollen types were selected for in vivo studies by ELISA on a number of allergic patients. Depending on ELISA response Borassus and Phoenix pollen were selected for further and detail studies.

In case of Borassus flabellifer or palmyra palm pollen a 90 kD protein component was isolated and purified by two-step ammonium sulphate fractionation and gel filtration. This component was found to be a major allergen by ELISA inhibition.

For Phoenix sylvestris or date sugar palm pollen, an allergenic component was isolated and purified partially using the same method as used for Borassus. The fraction showed a single band in native condition but two components of 33 kD and 66 kD molecular mass were detected in SDS-PAGE. Both of the components were found to be allergenic by immunoblotting. The crude pollen extract and all the fractions were also found to be antigenically active in immunoelectrophoresis with anti-Phoenix rabbit sera.

Further, four pollen types belonging to the family Arecaceae and frequent in the air of Madhyamgram were selected to study their allergenic and antigenic relationships, namely Areca, Borassus, Cocos and Phoenix. In IgE specific ELISA inhibition and dot immunoblotting, all these pollen types showed a clear allergenic cross reaction among
themselves. The antigenic cross reactivity was visualised by IgG specific ELISA inhibition and rocket immunoelectrophoresis using rabbit antisera.

There was an attempt to record the airborne allergen and antigen originating from *Borassus* pollen by immunoblotting of exposed Burkard tape segments using sensitive patient sera and rabbit antisera. The airborne pollen count showed a direct positive correlation with the allergen and antigen spots. The difference of pollen and spot size indicated that the air transported not the pollen grains alone but also smaller allergenic and antigenic particles. Such evaluation of the allergen exposure may be helpful for pollinosis patients.

In this thesis work, an attempt has been made to apply the acquired knowledge in identifying the airborne biopollutant components to help the people suffering from respiratory allergic disorders in West Bengal, particularly those who live in the vicinity of the study area.